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Beneficial effect of micro irrigation in the field

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Abstract

The irrigation is one of the major sources of the crop. Nowadays the irrigation can be defecate due to biotic and abiotic factors. So that ground water level is decreased day by day. And the crop cultivation was less, because scanty of irrigated water in the field. To replenish the irrigation water in the field by using the drip irrigation techniques, Micro irrigation is one of the important methods in the world. Because it provide irrigation water and nutrients to the plant roots and maintaining the crop yield.

Keywords: Drip irrigation, components

Introduction

The artificial application of water to the cropped field is irrigation, its maintain the soil moisture to the root zone of the crop plants. The differences in soil water regimes, the effect of irrigation development of crop root systems also differed from irrigation technique. The Micro irrigation is can be prove that to save the irrigation water at any season. Because, crop required the water at maximum or minimum level for their growth, but the farmer supply the water to the crop field excessively. So that the scientist find out the Micro irrigation method, to supply the water to the crop at the root zone. In this way to save the irrigation wastage in the crop field. And hence the use of Micro irrigation to reduce the soil surface evaporation and soil runoff. The Micro-irrigation is otherwise called as localised irrigation, low volume irrigation, low-flow irrigation, or trickle irrigation. In the agriculture for row crops, orchards, and vineyards the low volume irrigation is can be used. The micro irrigation is can be classified as drip irrigation and sprinkler irrigation. The drip irrigation is a type of micro-irrigation systems that have the prospective to save the irrigation water and nutrients. Its allow the water directly to the root zones of the plants and its minimize the evaporation. Drip irrigation is the most efficient and new technology of irrigation in India to supply precise amounts of water directly into the vicinity of root zone at right time, matching with the consumptive water demand of plant for optimum growth, improved yield and quality of produce with substantial water saving (Kumar *et al.*, 2005; Shashidhara *et al.*, 2007; Thangaselvabai *et al.*, 2009) ^[1, 2, 3]

Micro Irrigation

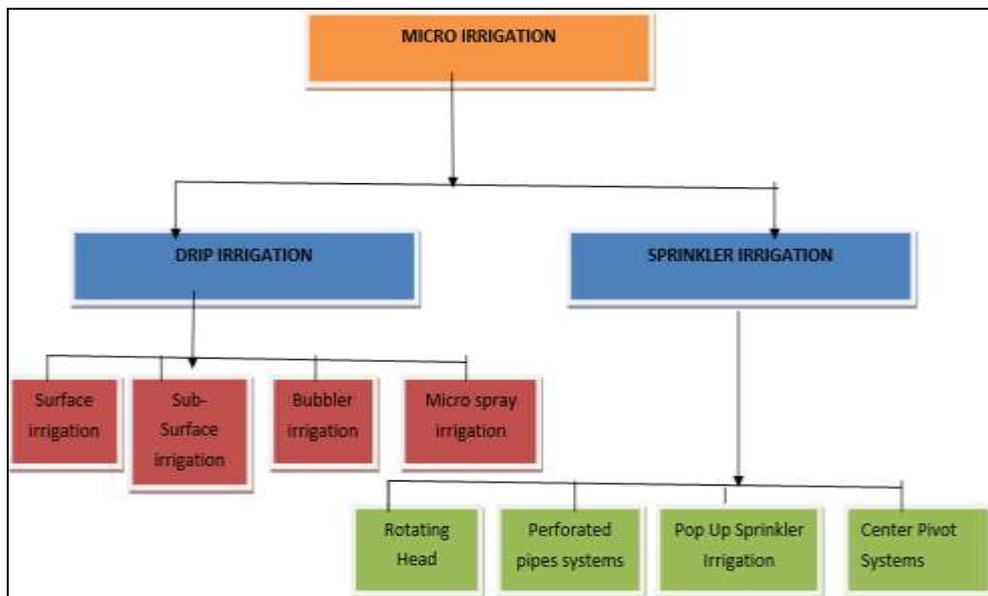
Delivery of water at low flow rates through various types of water applicators by a distribution system located on the soil surface, beneath the surface or suspended above the ground. Micro irrigation is the system that provides precise quantity of water in and around root zone of plant with the help of irrigation pipe net work and emitters.

- Bahadur and Singh (2001).

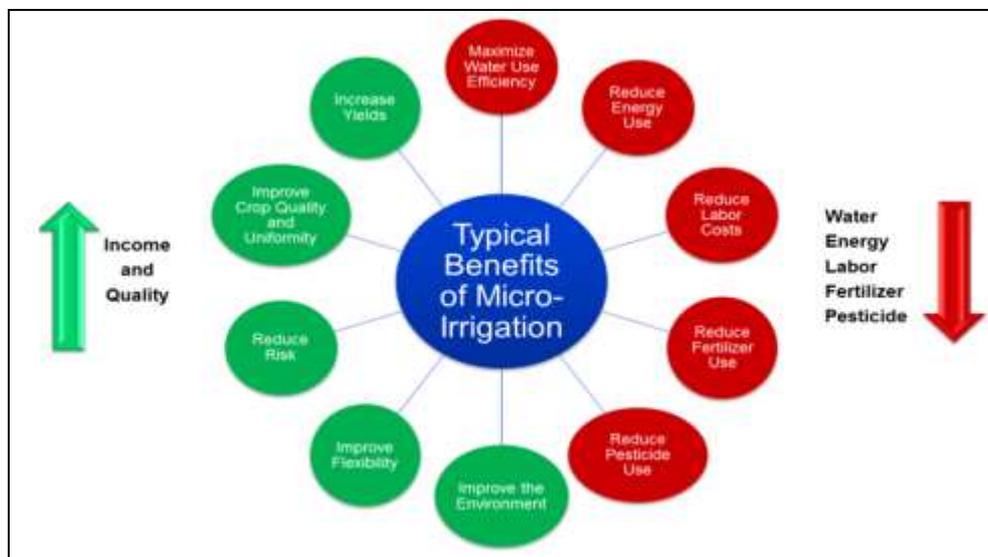
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Beneficial Effect of Micro Irrigation



Drip Irrigation

Drip irrigation system, is also known as trickle irrigation, consists of large network of pipelines through which water is carried and applied nearer to the plant root zone through an emitting device.

Drip irrigation refers to frequent application of small quantities of water on or below the soil surface as drops. It embodies the philosophy of irrigating the root zone instead of entire land. The drip fertigation method has considerable potential to improve water and fertilizer use efficiency. (Uddipta *et al.*, 2018) [4]



Micro- irrigation in the crop field

Some research can be conducted by the scientist to find out

the beneficial effect of the drip irrigation in the agricultural field.

Drip System Layout

A typical drip irrigation system is shown in Figure 1.

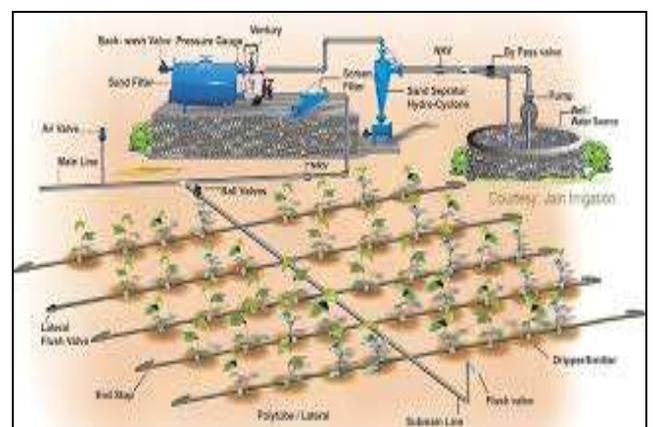


Fig 1: Shows in typical drip irrigation system

Suitable of Drip Irrigation

The drip irrigation is also called as trickle irrigation and its

involve dripping water on the root zones of the plants at very low level (2-20 lit/hr).

Drip irrigation for crops

Drip irrigation is most suitable for row crops such as (vegetables, soft fruit), tree and vine crops, and hence one or more emitters can be provided for each plant.

Drip irrigation for slopes

The drip irrigation is suitable for any farmable slope. In general the crop would be planted beside the contour lines and the water supply pipes (laterals) would be laid along the contour also.

Drip irrigation for soils

Drip irrigation is appropriate for most soils such as clay soils and sandy soils. In clay soils water must be applied slowly to avoid surface water ponding and runoff. In sandy soils higher emitter discharge rates will be needed, because to ensure the adequate lateral wetting of the soil.

Drip irrigation Uses

Drip irrigation is used in commercial greenhouses, farms, and residential gardeners. It is used in acute water scarcity areas and especially for crops and trees such as coconuts, containerized landscape trees, grapes, bananas, ber, citrus, strawberries, sugarcane, cotton, maize, and tomatoes.

Components of Drip irrigation

Components used in drip irrigation include below:-



Maintenance of drip irrigation equipment

Clogging is the main problem in Drip irrigation

1. Physical Clogging-Particulates (Sand, silt)
 - Solution: Filtration of irrigation water
2. Chemical precipitates clogging (CaCO₃ & other salts)
 - Solution: pH control of irrigation water
3. Biological Sources (organic debris, algae, fungi etc)

Solution: Filtration (usually media filters)+Biocide

Sub Surface Drip Irrigation

- Water applied through small emitter openings below the soil surface.
- Basically a surface system that's been buried (few inches to a couple feet).
- And it is permanent installation in the field.



Advantages of Drip Irrigation

1. Maximum use of available water.
2. No water being available to weeds.
3. High efficiency in the use of fertilizers.
4. Maximum crop yield.
5. Less weed growth and restrict population of potential hosts.
6. Low labour and relatively low operation cost.
7. No soil erosion.
8. Improved infiltration in soil of low intake.
9. No runoff of fertilizers into ground water.
10. Less evaporation losses of water as compared to surface irrigation.
11. Decreased tillage operations.
12. Improves seed germination.

Disadvantages of Drip Irrigation:

The fact that drip irrigation has so many possible benefits, but they have a certain limitation also, there are as follow:

1. Sensitivity to clogging.
2. Moisture distribution problem.
3. Salinity hazards.
4. High cost compared to furrow.
5. High skill is required for design, install and operation.

Conclusion

From the above discussed points, it is clear that drip and sprinkler irrigation systems maximizes water use efficiency and increases the crop yield compare to conventional method of irrigation and also it saves nearly 60% of water.

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